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AUTHOR Meyer, John W.; And Others
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ABSTRACT

An analysis of worldwide educational expansion between 1950 and 1970 is presented along with explanations for the expansion. The paper particularly addresses the socialization process and the institutionalization of schooling along national lines. Section I reviews available theories which seek to explain the expansion of education in the modern world as a function of variables in national structural characteristics. Theories discussed are economic, political, social, authoritarian, ethnic, and colonial in nature. In section II, descriptive data are presented which indicate that the rapid expansion of education since World War II is not related to national structural characteristics. In the third section diffusion models are presented which describe how the educational process occurs, followed by further explanation in section IV of why institutions expand. Findings indicate that very little variation in educational growth is accounted for by any measure of national economic, political, or social structure. The final section identifies and discusses emergent features of world society which have triggered the educational revolution by fostering formal socialization, prolonged student dependency, and the global redefinition of elites and masses. References are included. (Author/DE)

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THE WORLD EDUCATIONAL REVOLUTION, 1950-1970*

John W. Meyer
Department of Sociology
Stanford University

Francisco O. Ramirez
Department of Sociology
San Francisco State University

Richard Rubinson
Department of Social Relations
Johns Hopkins University

John Boli-Bennett
Department of Sociology
Stanford University

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THE WORLD EDUCATIONAL REVOLUTION, 1950-1970

National educational systems are strongly institutionalized throughout the contemporary world. Every country requires its children to undergo a certain period of formal schooling. Educational expenditures have become a taken-for-granted component of public expenditures. Complex rule structures define and regulate various aspects of educational institutions: admissions, exams, curriculum, degrees, etc.; inflationary educational criteria must be met in order to enter a rapidly increasing number of occupations. The educational system endows a substantial proportion of the human race--probably between 10 and 20 percent--with the distinctive social status student. The institutionalization of schooling generates discussions of a reified school age (with its appropriate psycho-social crises) as an intrinsic feature of the life cycle (Erikson, 1959).

The rise and expansion of these massive socialization and classification systems demands more by way of explanation than has yet been accomplished. In this paper we discuss educational expansion between 1950 and 1970. We attempt some explanations, and in a limited and statistical way we try to address some of the same issues brought up by Philippe Ariés (1962) in his grand attempt to reconstruct and renovate this field.

In the first section we review available theories which seek to explain the expansion of education in the modern world as a function of variations in national structural characteristics. In Section II we present some simple descriptive data which show that since World War II education has expanded at such a rate as to suggest that the whole process is affected by factors exogenous to national structural characteristics. We address this problem in Section III by formulating diffusion models which describe how

the process occurs. But this is a descriptive venture: diffusion models do not really explain why an institution expands. So in Section IV we return to the explanatory issue: What national characteristics, over and above the diffusion process we observe, affect educational expansion? Our analyses show that very little variation in educational growth is accounted for by any measure of national economic, political, or social structure.

In the final section we confront the problem of explanation at another level: we identify and discuss some emergent features of world society which have triggered the world educational revolution. That is, we focus on the organizational and cultural milieu which during the period under study penetrated all nations with ideologies fostering formal socialization, prolonged dependency, and the redefinition of elites and masses as progress-oriented "moderns" integrated into national political structures.

I. THEORIES OF NATIONAL EDUCATIONAL EXPANSION

A number of economic, political, and social forces are generally supposed, in the literature, to lead to educational expansion. Most theorists have viewed these forces as characteristics of national societies. We briefly summarize the arguments that link each of them to national educational expansion. In Section IV, we analyze cross-national data taken in 1955 and 1970 to test these propositions.

Proposition 1: Economic development stimulates educational expansion. Economic development, many argue, operates on both the individual and the societal levels. At the individual level, in more industrialized societies people confront labor markets more thoroughly organized around educational credentials and skills. Higher levels of educational attainment are likely to become prerequisites for access to an increasing number of occupations.

Thus, more individuals desire and obtain a greater amount of schooling for themselves and their children. The more developed the society, the more education becomes a reasonable human investment for upgrading one's economic prospects (Blau and Duncan, 1967). Further, in industial societies the tradional criteria of status and prestige are viewed as arbitrary and unfair. Membership in local and national status systems increasingly depends on the level and kind of education attained (Collins, 1971). Thus in economically advanced societies education becomes an important status consumption item. Finally, it seems clear that in such societies individuals possess more resources with which to purchase education, both as a consumption good and for human investment purposes.

At the aggregate level similar arguments are made. Education is seen as a useful investment to further economic development, and theories of its economic role enjoy wide circulation (e.g., Blaug, ed., 1968, 1969; Machlup, 1972). Dreeben (1968) among others, argues that education in developed societies is necessary for the maintenance of advanced technological structures and work organizations: it provides people with needed skills and orientations. Further, more developed societies have more resources to allocate to education, both as an investment and as a consumption good.[1]

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[1]Some additional arguments have it that education arises as a social control (or "babysitting") device in modern economies because (a) the family structure can no longer train and control children, or (b) technological development eliminates the jobs of children and leaves a large pool of unemployed youth requiring social control or socialization. These arguments are sometimes made about long-range historical processes, but rarely about specific educational changes in modern societies.

The recent argument that education arises as an elite device to socialize people to accept the modern stratification system as legitimate (e.g., Bowles and Gintis, 1976) is simply a variant of more general views of education as a socializing agent for the modern economy.

A possibly negative effect of economic development on education receives less attention (but see Machlup, 1972). Educational costs consist mainly of teacher salaries, which rise dramatically with development (e.g., Garms, 1968). The cost of educating each student is thus higher the more developed the country.

The empirical literature relating education and economic development is mostly cross-sectional in design; close relationships are found, but the causal order is in dispute. Longitudinal studies typically examine educational effects on economic variables (Steadman, 1970; Meyer, et al., 1973), though Bowman and Anderson (1963) emphasize the primacy of economic effects on education.

Proposition 2: Political and social modernization foster educational expansion. This idea parallels the economic development argument. Modern institutional structures and value patterns, such as the institutionalization of the dignity of the individual, the development of participatory citizenship, the expansion of bureaucratic organization, and the creation of modern life-styles create both individual and aggregate demands for educational expansion. Some specific mechanisms include:

(a) Modern representative polities require a high level of citizen participation and thus a developed sense of political efficacy as well as a commitment to conceptions of the public good. Such polities expand mass educational systems to create participatory citizens (Almond and Verba, 1965; Inkeles and Smith, 1974). For similar reasons, individuals in such polities demand education because they already have participatory political orientations.

(b) Modern representative polities are more tolerant of competing status groups and are more likely to respond to groups' efforts to penetrate such modern institutions as education (Ben-David and Zloczower, 1962; Collins, 1971). Thus education expands in response to accelerated demand.

(c) Successful participation in, and the legitimation of, modern bureaucratic organization and life styles require the creation of "new persons" with skills and orientations governed by universalistic rules. Modernization theorists argue that the curricula and structural arrangements of schools meet these demands (Parsons, 1959; Dreeben, 1968). Further, individuals possessing such orientations press for more education.

Despite the well-known discussions of the interrelationships between modernization and education (Lipset, 1959; Inkeles and Smith, 1974), there are virtually no comparative analyses of the impact of nation-level variations in political and social modernization on subsequent educational developments. (For some earlier analyses, see Ramirez, et al., 1973.)

Proposition 3: States which are more powerful and authoritative in society expand education more rapidly. The construction and institutionalization of corporate authority in the state is a central theme in political theory (Huntington, 1968; Swanson, 1971). Nation-states have engaged in long processes of nation- and state-building which have involved elaborate efforts to extend citizenship to their populations (Bendix, 1964). Crucial to the extension of citizenship is mass education, which (a) creates and maintains the common national culture and its myths (nation-building), and (b) turns each citizen, in some measure, into an agent of the collectivity (state-building). The close connection between education and the rise of the modern nation-state was noted early on (e.g., Merriam, 1931; Reisner, 1927) and should be accentuated in the modern world because nation-states generally

regulate and control educational systems directly (Ramirez, 1974; Rubinson, 1974). However, interest in this argument has declined in the recent literature, which concentrates on economic factors.

Proposition 4: Ethnically plural societies expand education more slowly than others. Analysts generally assume that nation-building--and the expansion of education--is more costly and wrought with conflict in a heterogeneous society. Functional arguments have it that such societies have exceptional needs for a unifying culture, needs that go unmet for generations. A more common argument holds that education slowly destroys pluralism, but that pluralism also slows down the expansion of education (Warren, 1973).

Proposition 5: Dependent states and societies expand education more slowly than others. This proposition follows from the supposedly close association between education and the strong nation-state. Current dependence theories (Frank, 1969; Chase-Dunn and Rubinson, 1976) see national integration--and, presumably, education--as slowed down by colonial or peripheral status in the world system. National or colonial elites in such societies derive their power from their links with metropolitan centers, not their success in integrating their populations into a national culture.[2] Dependent societies, further, are less likely to be able to adapt to modern institutions because they lack control of sufficient resources.

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[2]But it has also been observed that there is a correlation between the historical period in which an organization is created and the structure of that organization in the present (Stinchcombe, 1965). If it is true that the post-World War II era is one favoring rapid educational growth, then recency of independence or autonomy may be an asset.

II: THE PROBLEM: WORLD EDUCATIONAL EXPANSION AFTER 1950

The theories reviewed above see the foundations of modern educational systems as lying in the economic and political structures of autonomous national societies. In these theories changes occur as national societies independently undergo economic and political modernization. The imagery involved suggests that some societies should expand educationally, during a given period, while others should not--some should even contract their educational systems.

The current theories did not prepare the social scientists of the 1950s for the educational revolution of the last 25 years (Coombs, 1968), and few clear explanations exist even now. One gets the impression that we ignore a phenomenon for which we have no very clear explanation. When the current educational revolution is discussed, it is sometimes seen even as a kind of social problem, with the fear arising that many newly educated people will have nothing to do but make trouble (Schumpeter, 1950).

The educational situation is described in Table 1. We take from UNESCO (1971) statistics on educational enrollment in national societies. Data are reported on the number of students in primary, secondary, and higher education in each country. UNESCO statisticians standardize these data by census estimates of the number of persons in the age-group appropriate for each level of education. Thus, in a country in which secondary education has a six-year cycle running from about age 12 to age 18, the number of people in this age-group would be used as the denominator for the enrollment ratio.

These data contain much error: (a) countries often overreport enrollments (in their internal accounting systems); (b) census reports often underestimate the population bases used as denominators in computing enrollment

ratios, and (c) in some countries large numbers of over-aged persons are in primary school, so that enrollment ratios in a number of instances rise considerably above 100%. Further, we have no data on the days or hours children attend school--or whether they actually attend at all. And for all we know, children may enroll in school for six consecutive years--entering the international record-keeping system each year--without ever learning to read, progressing to higher grades, or even participating at all.

Nevertheless, detailed investigation at UNESCO convinces us that they have assembled the data with considerable skill and care. And it is clear that errors are decreasing--not increasing--as time goes on, which makes the findings of Table 1 especially surprising.

The table shows the mean primary, secondary, and higher education enrollment ratios for all countries for which continuous data are available from 1950 to 1970.[3] We further divide the countries into a richer half and a poorer half (at $172 in 1950 per capita GNP, measured in 1964 U.S. dollars), and report the mean ratios for each group.

Table 1 shows extraordinary social change around the world in a 20 year period. The mean reported primary enrollment ratio went from 58 to 83 percent. It might have gone even higher, except that many countries reached or surpassed the ceiling of 100%.

The figures for secondary and higher education--unrestricted by ceiling effects--are even more dramatic. The secondary education ratio more than doubled in the richer countries and more than tripled in the

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[3] Since countries very greatly in size, these means do not, of course, describe the experience of the average child.

poorer ones. Higher education almost quadrupled. And even more striking--all these large increases in ratios took place in a world in which the absolute size of the age groups involved was increasing very rapidly (in each case, between 50 and 100% during this 20 year period). Thus, larger and larger proportions of rapidly expanding age groups were in school.

Distinguishing between richer and poorer countries shows that dramatic changes occurred for both groups. But more detailed examination of the data on individual countries shows an even more striking result. In no country for which data are reported did the secondary or higher educational enrollment ratio decline from 1950 to 1970. And the only cases in which the primary ratio declined were those reporting over 90% enrolled at the beginning of the period (in which case technical factors--including a decline in the enrollment of over-aged persons--are the obvious explanation). The expansion of the modern educational system as a social structure penetrating society was practically universal and very rapid, during the 1950-1970 period.

These simple findings change the problem of explanation a great deal. Even if all the theories discussed above hold true, they cannot hope to account for a four-fold increase, over 20 years, in the proportion of young people attending universities, or a doubling of the proportion of adolescents in secondary schools--particularly when these increases occurred for every country on which data are available.

The intellectual problem, then, is as follows: we know that the universal expansion of education either reflects some emergent characteristics of world society, or else it is due to properties of nation-states (or other subunits) which are essentially universal. In the final section of this paper we will discuss some of the global-level factors which may be involved.

Our immediate problem is to model the process of educational expansion well enough to be able to analyze the impact of the factors discussed above on it.

III. MODELS OF SELF-GENERATING EDUCATIONAL EXPANSION

The results of Table 1 showed explosive growth in education since 1950 everywhere in the world. Formal educational systems have diffused into, and expanded within, all national societies. This fact suggests that national educational systems in this period have a self-generating character: to some, perhaps large, extent they invariably strive toward total absorption of the appropriate age-groups. This self-generating character may inhere in all national systems, or it may reflect the demands placed on national systems by the larger world system with which they must contend. At any rate, the ability of the systems to diffuse is not absolute. It depends in a complicated way on their initial characteristics, especially on the extent to which they have already absorbed the age-groups.

In Section IV we will see if such national properties as economic development or political modernization explain where this self-generating process occurs most rapidly. First, however, models of the process itself are in order. Having modeled the process, we can then determine whether other factors affect educational expansion over and above the expansion that is built into the whole system.

With many longitudinal models this task would not be difficult. If, for instance, one studies the economic wealth of countries (which also expanded considerably over our period), one can propose that a country's GNP in 1970 is a simple linear function of its GNP in 1955; that is, all countries tend to grow at much the same rate. And in fact this is a reasonable first approximation of economic growth from 1950 to 1970 (Meyer et al., 1975).

But educational systems have some additional properties which make simple models--built around a single term describing the autocorrelation of a variable--inappropriate: (1) Education can be greatly affected by differential changes, among countries, in the available pool of children. In richer countries the number of primary-aged children has expanded rather slowly since 1950: in most poorer countries it has expanded rapidly. (2) Educational expansion is limited by ceiling effects: expansion in a country already at 100% enrollment tends to be limited to the growth of the age-group population.[4] (3) Educational expansion is much less limited by fixed properties of a society than other social variables like GNP. Economic growth requires tangible resources and effort, while the redefinition of many people as pupils and some people as teachers can be much less costly. In a period in which the world system is generating practically universal educational expansion, a particular country's expansion may be restricted less by its initial education than by the available uneducated population. (4) Further, for secondary and higher education, the pool of available persons is defined not only by the whole age group population but also by the number of persons graduating from the preceding level of schooling.

These considerations make it clear that in establishing our baseline models of educational expansion we must move beyond linear autocorrelations (the simplest of diffusion models) to more complex ideas in the tradition of

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[4] Or countries can educate the same population more intensively. We have no measures of the days, hours, curricular intensity, and elaboration of rules surrounding the educational systems we study. In countries like the U.S., with very high enrollment ratios, further expansion takes the form of increasing amounts of time per year spent under education jurisdictions, and increasingly elaborate rule and meaning systems defining education at the national and state levels.

diffusion research. We can roughly distinguish two "families" of relevant models, both of which we use below (Rogers, 1962).

A. Some diffusion models ("contagion models") imply that education expands into the previously uneducated sectors of the population at a rate determined by the original proportion of educated people. The idea that education expands at a rate determined by its initial level (and by the number of uneducated people) produces the S-shaped curve of contagious diffusion theory.

B. Other diffusion models ("diffusion from a constant source") imply that education expands at a rate determined only by the size of the previously uneducated population. Such models produce an increasing but decelerating curve of educational enrollments over time. Comparing countries, those which start lower should grow more because they have a larger proportion of the population available for expansion.

We distinguish these two types of processes, though they are not especially closely linked to distinct substantive theories about the nature of educational expansion, because they are distinguished in the diffusion literature and can be separately modelled. The empirical question of concern is: How much does educational expansion depend on both the available uneducated population and the initial size of the system? In other words, how well can diffusion processes "account for" the education explosion of Table 1?

A. Primary Education: We build our model of primary educational expansion around the following assumptions:

(1) The maintenance of a constant proportion of the age group in primary school is not problematic. What is to be explained is the increase in enrollment beyond this level. This assumes that countries can easily provide schools and teachers for expanding populations of children, but that expanding the proportion of children educated represents a more difficult change in the structure and

strata of society.[5] That is, our dependent variable in this analysis is the primary enrollment ratio at time 1 minus the same ratio at time 2.

(2) Diffusion from the extant educational system: We argue here that the rate of expansion of the primary education ratio is proportional to the initial size of the ratio, but also proportional to the proportion of the age group not in school. This argument produces the classic S-shaped curve of diffusion theory--the idea that diffusion depends both on the number of elements from which it takes place and the number of elements remaining to which it can take place. The idea involved is that education diffuses at a constant rate from each student into the available remaining uneducated age group population. Growth occurs slowly at first (among countries low in primary enrollment ratios), then more rapidly. But as the proportion educated passes 50%, the rate of expansion drops: the number of educated grows, but the number of uneducated available for "conversion" declines rapidly, Thus each country follows an S-curve. The formal argument for our set of countries is that the primary enrollment ratio (p_1) expands at some constant function of $p_1(1-p_1)$.

(3) Expansion at a constant rate from a constant source to the uneducated population: Perhaps education doesn't really diffuse from schools and teachers, but simply from the structure of the world system and the nation-state. As it were, a switch was thrown in 1950, after which education expanded everywhere independent of the initial presence of schools and teachers and customs within particular countries. This produces the classic diffusion theory idea of expansion into the "unconverted" population at a constant rate. Since this population is constantly declining, a simple decelerating curve is generated, with a ceiling at 100%. But formally, this argument has it that the primary ratio (p_1) expands at some constant function of $(1-p_1)$.

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[5] This idea makes much more sense than it seems. Educational costs are predominantly teacher salaries. In poor countries these are quite low: that is why studying enrollments is more relevent to our general interests than studying educational expenditures (e.g., Garms, 1968). Educational costs are highly variable depending almost entirely on the per capita wealth of a country.

(4) Methodological corrections:

a. Obviously, our models require constant terms to describe aggregate tendencies of our models to over- or under-predict primary enrollments.

b. We have assumed that the maintenance of a constant primary ratio is not problematic. Perhaps this is not so, and countries with more rapidly expanding age-groups have more difficulty keeping up. This argument implies that primary ratio expansion is a negative function of the rate of expansion of the primary-aged population.

c. Finally, we include in our models, for methodological reasons, the term 1/ Primary Population$_2$. Criticisms of analyses using ratio variables (Freeman & Kronenfeld, 1973; Schuessler, 1973; Fuiguitt & Lieberson, 1974) show that findings may result from effects on denominators as well as on the numerators of interest. Findings may be further distorted by correlated errors among the population terms used to standardize the variables, and so on. To eliminate this problem, our model is formulated so that it can be interpreted as a weighted least squares estimate of raw primary enrollment at time 2, as well as with the ratio language employed in the text.[6]

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[6] In this case the model being estimated becomes, if P_1 is the primary population at time 1, p_1 is the primary ratio at time 1 and $PPop_1$ is the primary age-group population at time 1:

$$P_2 = 1 \cdot P_1(PPop_2/PPop_1) + a + b_1p_1(1-p_1)PPop_2 + b_2(1-p_1)PPop_2$$
$$+ b_3(PPop2/PPop_1)PPop2 \quad .$$

The terms in this equation are very badly skewed (and residual variance is highly correlated with independent variables), so weighted least squares is the appropriate estimating technique. Every term, including the constant, is weighted by $1/PPop_2$. This leaves a coefficient for the weighting term in the estimated equation. The actual equation produced after weighting is the one defined in the text. It can be seen as an equation with the ratio interpretation given in the text or as a weighted least squares estimate of P_2. The slopes and standard errors reported below apply to either interpretation--the standardized slope and R^2, however, apply only to the ratio interpretation.

Thus we estimate, for data on primary enrollment expansion, the following equation:

$$P_{70} - P_{55} = a + b_1 P_{55}(1-P_{55}) + b_2(1-P_{55}) + b_3 PPop_{70}/PPop_{55} + b_4/PPop_{70};$$

where P_{55} = primary enrollment/age group, 1955; and

$PPop_{55}$ = primary age-group population in 1955 (estimated from UNESCO (1971) reports of raw enrollments and enrollment ratios.

We use the time lag 1955-1970 because it provides enough time for substantial enrollment changes to have taken place while avoiding using 1950 data, which are (a) available for fewer cases; and (b) more likely to be distorted by the aftermath of World War II. In other analyses we have used the time lag from 1950-1965, without substantially different results.

B. Secondary and Higher Education: Exactly the same reasoning as with primary education generates our models of expansion of secondary and higher education. Three changes are made: (1) Because almost all countries have rather low proportions of the eligible age-groups in secondary schools and colleges, the term $s_{55}(1-s_{55})$ is highly negatively correlated (-.89) with the term $(1-s_{55})$ and the correlation for tertiary (or higher) education is even more extreme (-.99). This multicollinearity makes estimation impossible, so we drop the terms $(1-s_{55})$ and $(1-t_{55})$[7] from our models. In practice there is little intellectual cost here: the general inclination of all educational systems to absorb uneducated populations (over and above the opportunities and limitations created by their initial situations) is now captured in other terms in these equations. The ceiling limitation captured

[7] We use the symbol t_{55} for the tertiary or higher educational ratio in 1955.

by $(1-s_{55})$ and $(1-t_{55})$ is not only multicollinear but unnecessary, since few countries are even near the limit on secondary or tertiary education.

(2) Secondary and higher educational enrollments may each be affected by earlier expansion of the preceding level. An expanded primary system creates many more candidates for secondary school; it may also create various organizational impetuses. Because it may play both roles it is ambiguously related to our original distinction between "contagious" and "constant rate of penetration" diffusion models. In any event, we incorporate in our model of secondary education a term $p_{55}(1-s_{55})$, which argues that the previously uneducated secondary sector is penetrated at some linear function of the earlier primary rate. Our model for tertiary enrollments similarly incorporates a term $s_{55}(1-t_{55})$.[8]

(3) We do not have accurate data on secondary and higher education age-group populations. We substitute overall population growth for growth in the age-group population. We also use overall population as the weighting or correction term. These alterations undoubtedly make little difference in our findings.

C. Data Exclusions: In analyzing university education, we drop the United States from the analysis. The U.S. has extremely high rates of tertiary education; we exclude it to avoid having one extreme case distort our analysis. As it turns out, this exclusion makes very little difference.

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[8] One could argue that enrollments might be affected by the size of the next level above; e.g., that expanded higher education would create demand for and organizational impetus toward secondary education. In many analyses we have found no such effects, perhaps because in few countries does the expansion of secondary school approach the ceiling of primary graduates, and in no case does the tertiary system begin to absorb all the secondary graduates.

In analyzing primary education we exclude all countries which had 90% or more of their eligible age-groups in primary school in 1955. Such countries are so near the ceiling that further increases (or decreases, in the cases of those reporting over 100% enrolled due to errors or the enrollment of over-aged people) may indicate measurement error more than variance of interest. This eliminates 37 cases from the analysis of primary education.

D. Findings: We estimate our models with ordinary least squares multiple-regression equations incorporating all the factors defined in this section. We use the UNESCO data, described earlier, for 1955 and 1970. The results are shown in Table 2. Each row of the table reports the findings for one level of education, with the slope, standardized slope, and standard error of the slope associated with each independent variable. To provide some aid in interpretation, we have grouped the independent terms according to whether they (a) reflect the imagery of contagious diffusion, (b) reflect a constant rate of penetration process, or (c) reflect both of these processes in an ambiguous way.

The results are quite striking. First, these diffusion models can account for a good deal of variance in each type of educational expansion over the period.[9] That is, properties of the population and the educational system itself explain (in a statistical sense) how much educational expansion occurs.

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[9] The R^2 for primary education is lower than the others, probably because much of the variance in the dependent variable is measurement error around the 100% ceiling which many countries reach or surpass.

Second, the classic S-curve describes a large component of educational expansion. Countries having very low ratios expand more slowly, those in the middle of the scale expand more rapidly, and those near the ceiling expand more slowly again.

Third, the size of the available uneducated population sector plays a substantial role for primary education, and the available population produced by the preceding education level plays an even stronger role for secondary and higher education. To some extent, in other words, the image of a diffusion force "converting" the available population at a constant rate applies.

It should be emphasized that these models do not <u>explain</u> the expansion of education throughout the world. They simply show <u>how</u> this increase occurs in particular national units. The classic S-curve describes much of the process [<u>i.e.</u>, $p_{55}(1-p_{55})$]. So does the simple idea of expansion by a constant rate of absorption of the uneducated population [$1-p_{55}$; and for secondary and tertiary education, the preceding level terms, $p_{55}(1-s_{55})$ and $s_{55}(1-t_{55})$]. Our problem now is to see if other attributes of countries can contribute further to explaining educational expansion, given that much of the expansion is "built-in" for all national systems over our period. In none of the equations do the diffusion processes account for so much variance as to artificially prohibit other factors from having significant effects.

IV. EFFECTS OF POLITICAL, SOCIAL, AND ECONOMIC VARIABLES ON EDUCATIONAL EXPANSION

We have examined the processes of educational expansion which, in the present world system, are built into education itself. We return now to the question of how other factors enter in: over and above the educational expansion predicted by our diffusion models, do other attributes of societies contribute to expansion? Earlier we reviewed several factors which the literature suggests play a causal role in accounting for variations in the expansion of education. We now consider particular indicators of these factors and present some empirical analyses.

A. Variables and Indicators: We employ indicators of each of five factors:

1. Economic Development: We employ standard indicators, all highly intercorrelated (over .80):

   a. The Logarithm of the Gross National Product Per Capita 1955. The data are taken from the IBRD (1971), and are measured in 1964 U.S. dollars. The measure is logged to make its distribution suitable for regression analysis.

   b. The Log of the Kilowatt Hours of Electricity Consumed Per Capita, 1955. Data on energy consumption are taken from Taylor and Hudson (1971).

   c. The Percentage of the Male Labor Force Not in Agriculture, 1950 (ILO, 1971). The relative expansion of the industrial and service sectors is a conventional indicator of economic development.

2. Political and Social Modernization: We use four different measures of modernization. They are fairly highly intercorrelated; all are positively related to economic development:

a. The Index of Formal Political Representation is coded for the years 1951-55. It was developed by Cutright (1963, 1969), and reflects the extent to which legislators and chief executives are popularly elected and the degree to which the legislature reflects diverse party interests. Only independent countries are included in the measure. Data are available primarily for more developed countries. Communist countries are not coded because of ambiguity in the meaning of the measures.

b. Political Participation is taken from Adelman and Morris (1973). It covers the 1957-62 time period for 74 non-Communist developing countries. Countries are coded on both their formal political structure and the actual level of participation in (and choice among) parties, interest groups, etc.

c. Urbanization (in 1950) is measured by the percent of the population living in cities of 100,000 or more (Davis, 1969).

d. Political Modernization: We employ C. E. Black's (1967) coding of the degree to which (and recency with which) elites committed to modernization control a country.

3. The Power and Authority of the State: There is little consensus on the meaning or measurement of this variable, though its importance is widely recognized. We utilize three empirically unrelated indicators to capture different aspects of the general concept:

a. The Index of State Centralization combines three indicators coded by Banks and Textor (1963): power concentration within the state, the presence of a single political party, and the presence of a "system style" mobilized around national purposes. The measure reflects the extent to which political authority is centralized in the national state, and Communist countries receive very high scores. Data are coded for the late 1950's.

b. Size of the National Cabinet is taken from Banks (1971), and coded for the years 1949-51. This measure, in some degree, indicates the extent to which the state has penetrated institutional structures, and symbolically linked diverse groups and interests to the state bureaucracy. Communist and other mobilized states usually receive high scores.

c. Government Revenue as a Percent of Gross Domestic Product, 1955 is taken from the IMF (1972). It indicates the level of economic resources controlled by the state. Scandinavian countries tend to receive high scores. Communist countries are not coded because their accounting criteria for distinguishing government revenue and other economic activity are not clear.

We employ these weakly interrelated measures because they should capture important, but distinct, aspects of what is meant by expanded state power: centralization of control, state penetration, and the rational bureaucratization of state authority.

4. As a measure of Social Heterogeneity we use an Ethnolinguistic Fractionalization Index taken from Taylor and Hudson (1971). Higher scores indicate more diverse societies.

5. Dependence: We use three different indicators:

a. As an indicator of Economic Dependence we use a country's Export Partner Concentration, 1955 (UN, 1950-).

b. To measure Political Dependence, we code countries on their independence as of 1957. Among countries independent by that date, we distinguish between those independent by 1945 and those which became independent between 1945 and 1957. This is a simplified measure of the organizational age of the nation-state, a variable whose importance is discussed in the political development literature (Huntington, 1968; Black, 1967).

Analysis Model: We now proceed to include the variables defined above in our models of self-generating educational expansion, in order to test the propositions presented at the beginning of this paper. We follow the basic panel analysis model--that is, we examine the effects of time 1 independent variables on time 2 dependent variables, with time 1 values of the dependent variable controlled (Heise, 1970). But our discussion above makes some

modifications necessary: (1) Values of the dependent variables are growing so rapidly that we must study growth scores. (2) For several methodological reasons, we further include as the basic control, not a simple autocorrelation term, but the complex equations developed in Section III.

One methodological aspect of our procedure must be noted. We do not simply add our substantive independent variables to the equations defined in Section III, leaving each coefficient free to vary with the inclusion of a new variable. This might be desirable, but in such analyses a great deal of multicollinearity arises (our independent variables are highly correlated with one or another term in the equations defined in Section III). Consequently, we treat those equations and their coefficients as fixed, entering them in their entirety as single terms in the regression equations examined below. Thus the first entry in the first column of Table 3, shows that Log GNP/Capita has an effect (i.e., standardized slope) of .10 on growth in the primary enrollment ratio in an equation in which the entire set of variables and coefficients defined in the diffusion model in Table 2 is entered as a single term, receiving in this instance a standardized slope of .63 which is not included in Table 3.[10]

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[10] It seems likely that independent variables affect educational expansion, not additively, but by changing the rate at which such diffusion processes as those defined in Table 2 operate. This would require entering our independent variables interacted by the diffusion models (also entering these models additively as a separate term). We have attempted many such analyses, but the multicollinearity is too great to permit interpretable results. As a consequence, we enter the independent variables in Table 3 additively.

Results: The findings of Table 3 are oddly dramatic. Only 6 of the 42 coefficients are significant at the .1 level, little more than would be expected by chance. Specific properties of nation-states do not substantially affect educational expansion over and above that which is built-in. This is the major import of the table. Some specific points can be noted in detail with reference to the propositions of Section I:

> Prop. 1: All three economic indicators show positive effects on all three educational levels. The effects are considerably smaller than the literature suggests. The small and insignificant effects on primary education may be explained by the fact that many countries are nearing the 100% ceiling so that much of the remaining variance may consist of error. The economic effects on secondary education are the strongest effects in the entire table.
>
> Prop. 2: No significant positive effects of modernization variables appear--indeed, a third of the effects are negative. Given the overall pattern, we dismiss the single significant negative coefficient in the table as an anomaly and conclude that there is no evidence of any effect at all.
>
> Prop. 3: Similarly, the three indicators of state power and authority show no effects.
>
> Prop. 4: Ethnic diversity shows negative coefficients on all three measures of educational expansion, but all are very far from statistical (or substantive) significance.
>
> Prop. 5: National dependence may show some negative effects on secondary and higher educational expansion (a theme suggested in the literature), but certainly none on primary education. Perhaps it is indeed true that peripheral countries utilize their metropolitan countries for elite education to some slight extent during this period. Perhaps metropolitan powers are cautious in expanding elite education (and potential elites) in colonies. In any event, the effects are very small.

Conclusion: We have examined data relevant to a range of hypotheses on national factors effecting educational expansion. These hypotheses receive little empirical support. Even economic development--the educational effects of which are treated in the literature as a truism--

has only small effects. And these are the only effects in which we have much confidence. Clearly, a good deal of variation in national educational expansion remains unexplained, even if we treat that variance predicted by our diffusion-process models as "explained."

In reviewing these findings we must emphasize that our data come from a particular period in history: the absence of effects in these data does not necessarily indicate their absence in an earlier period. In fact the cross-sectional correlations between education and economic development are very high; it seems likely that in the 18th and 19th centuries the economic development of countries played a strong role in producing educational expansion. It is the weakening of such effects that is now problematic.

V. THE ORGANIZATIONAL AND CULTURAL MILIEU OF THE WORLD SYSTEM AND THE EDUCATIONAL REVOLUTION

Our inability thus far to account for the rapid expansion of education since 1950 leads us to a consideration of general properties of the world as a unified social system. Political and economic variations among countries are less important than characteristics of the world system in this particular time period--the rates of self-generated expansion inhere in the system as a whole.

One relevant and striking feature of the present world is that it is made up almost entirely of independent nation-states, whose number has grown rapidly (from 65 in 1940 to 142 in 1970: Baker, 1971). The network of states is the dominant organizational structure of world society. Furthermore, almost all states play a central role in funding, constructing, controlling, and expanding educational systems: education is widely linked to state power and national unity. Perhaps it is the parcelling of the world among these

organizational units that accounts for the expansion of education. In Table 3 we found no suggestion of a positive educational effect of state power but small negative coefficients for state dependence and colonial status appeared. We explore the matter further here.

Two findings should appear if the formation or existence of an independent state in a given country affects educational expansion. First, throughout our period colonies should have low educational enrollment ratios, and they should be slow to expand education. Second, the period following independence (for countries becoming independent during our time period) should show an unusual jump in enrollment ratios as the state organization takes over and expands education. The literature on newly independent countries (e.g., Coleman, 1965) leads us to believe that new countries give great attention to educational expansion (or in any case to the correction of educational "deficits").

We therefore classify countries by date of independence, distinguishing those which became independent during each 5-year period from 1945 to 1970. We also have a group of colonies: countries which did not become independent by 1970. We divide the "old" (that is, pre-1945) countries into two groups on the basis of GNP/Capita; since most new countries are relatively poor, it makes sense to compare their enrollment ratios with those of the poorer older countries.

For each group of countries we calculate primary, secondary, and university enrollment ratios at five-year intervals from 1950 to 1970. This enables us to see, first, if the poorer older countries are generally high with colonies lowest, and second, if each group of countries shows an unexpectedly sharp increase in enrollments immediately after becoming independent.

The data are shown in Table 4. They show three main results of interest:

a. Countries which are colonies throughout the period have educational enrollment ratios, and rates of growth, much like all the others.

b. No detectable increase in the rate of educational growth follows the independence of countries.

c. All groups of countries show remarkably similar patterns of growth (especially considering the small case numbers). The different groups of countries in the Table start out at different educational points but follow similar upward paths.

These data lead to a clear conclusion: perhaps the state system plays an important role in educational expansion, but during the 1950-70 period the presence of absence of a nation-state in a given territory did not seem to make much difference. Given this result, what other features of the contemporary world system can we suggest to explain the world-wide expansion of education since 1950--features that could give rise to the pattern of Table 4? Conceiving the world system as a single society with an organizational and cultural milieu that penetrates virtually all countries ever more thoroughly and places rigorous demands on them, we raise the following possibilities (see Meyer et al., 1975):

(1) While countries vary enormously in terms of overall wealth and economic structure, all nations pursue common national economic development goals. Development strategies may vary across countries (with respect to the degree of state involvement, for example), but the development process is universally regarded as one that requires rational planning and technically trained manpower. Theories of the role of education in promoting development are continually validated through networks of international loans and aid, widespread practices of national planning (Waterston, 1965), and transnational conferences and seminars, all of which help perpetuate the present

world system's insistence on the primacy of scientific knowledge and technical expertise.[11] The expansion of education thus reflects convergence in the meaning and value of development despite differences in economic performance.

(2) From all political development perspectives, whether of the First, Second, or Third World, an educated citizenry is a highly valued asset. The Tanzanian leader, Nyerere, expressed what may well be a universal sentiment: "If I leave to others the building of our elementary school system they (the people) will abandon me as their responsible national leader" (Thompson, 1971). The expansion of education is politically desirable not only to create good citizens but also to legitimate responsible government. In a world that organizationally emphasizes both citizenship and state authority (as, for example, in the United Nations), the expansion of education becomes convenient political shorthand for articulating a commitment to both goals.

(3) "Human progress" is not only hailed but expected in the contemporary world. Individuals and countries are defined, not as static, but as improvable. The widespread faith in education as the device for transforming individuals and societies in this direction has led one critic to complain that schooling has become "the world religion of the modernized proletariat" (Illich, 1970) and another to observe that people act as if there were "no salvation outside higher education" (Shils, 1971). The

---

[11] The few exceptions to this feature are notable primarily for their rarity. Only in China has genuine opposition to the primacy of expertise arisen (the "Red versus expert" debate, in which "expert" is equivalent to "educated"). The debate will probably be settled by seeing to it that all Reds are defined as expert by virtue of their practical as well as formal education.

"new person" and the "new society" (Mao, Nyerere, Nkrumah, Castro, . . .) inevitably require more education.

(4) All of this occurs in a capitalist world economic system (Wallerstein, 1974). Every national society in the system must adapt to the strong pressures generated by no-holds-barred competition, competition that extends to social programs and cultural forms as well as economic production. Nations that do not forcefully adapt to the pressures are likely to be dominated by stronger nations (economic and cultural imperialism) (Boli-Bennett, 1976). This means that elites that do not pursue the ends of economic and political development--and education as a means to those ends--are likely to fall from power. They are replaced by more aggressive elites (usually local, sometimes foreign) who better conform to the demands of the world system and actively champion its goals and methods, seeking "national self-determination" and rapid mobilization of physical and human resources to make autonomy and economic expansion something more than mere rhetoric. These elites vigorously promote education as a means to such mobilization.

The impact of the contemporary world system on educational expansion is clearly very powerful. Universal education is necessary to realize the strongly institutionalized goals that define proper human conduct in our day: participatory citizenship, individual "self-actualization," and national economic and social "prosperity." Education is, further, an essential means to these goals, in its capacity to propagate (or at least certify) scientific and technical expertise and to legitimate expanded state authority. Beyond this, the capitalist world economy places competitive pressures on states, economic organizations, and other subunits that compel universal devotion to these goals and means. These considerations account not only for the

universal and rapid expansion of education but also for the increasingly similar forms that educational systems everywhere adopt. The world educational revolution has occurred despite variations in national structural characteristics because education has become an inherent component of progressive national development itself, and no nation can afford to do less than whole-heartedly pursue the notion of progress that reigns in our time.

References

Adelman, Irma and Cynthia Morris
1973 Economic Growth and Social Equity in Developing Countries. Stanford, Ca.: Stanford University Press

Almond, Gabriel A. and Sidney Verba
1965 The Civic Culture. Boston: Little, Brown, and Company.

Aries, Phillipe
1962 Centuries of Childhood. Translated by Robert Baldick. New York: Vintage Books.

Banks, Arthur S.
1971 Cross-Polity Time Series Data. Cambridge: MIT Press.

Banks, Arthur S. and Robert Textor
1963 A Cross-Polity Survey. Cambridge: MIT Press

Ben-David, Joseph and Abraham Zloczower
1962 "Universities and Academic Systems in Modern Societies." European Journal of Sociology, 3, pp. 45-85.

Bendix, Reinhard
1964 Nation-Building and Citizenship. New York: John Wiley.

Black, C.E.
1967 The Dynamics of Modernization. New York: Harper and Row.

Blaug, M. (ed.)
1968 Economics of Education, I, II. Baltimore: Penguin Books.
1969

Boli-Bennett, John
1976 The expansion of nation-states, 1870-1970. Unpublished doctoral dissertation, Stanford University.

Bowles, Samuel and H. Ginitis
1976 Schooling in Capitalist America. New York: Basic Books.

Bowman, Mary Jean, and C. Arnold Anderson
1963 "Concerning the Role of Education in Development," in Clifford Geertz, ed. Old Societies and New States. New York: The Free Press.

Blau, Peter and O.D. Duncan
1967 The American Occupational Structure. New York: John Wiley.

Chase-Dunn, Christopher and Richard Rubinson
1976 "A Structural Model of the World System." Unpublished paper, Department of Social Relations, Johns Hopkins University.

Coleman, James S. (ed.)
1965 Education and Political Development. Princeton: Princeton University Press.

Collins, Randall
1971 "Functional and Conflict Theories of Educational Stratification." American Sociological Review, 36 December, pp. 1002-1019.

Coombs, Philip H.
1968 The World Educational Crisis: A Systems Analysis. Oxford University Press.

Cutright, Phillips
1963 "National Political Development: Measurement and Analysis." American Sociological Review 28: 253-264.

Cutright, Phillips and James A. Wiley
1969-70 "Modernization and Political Representation: 1927-1966." Studies in Comparative International Development, 5.

Davis, Kingsley
1969 World Urbanization 1950-1970. Vol. 1. Population Monograph Series #4, U.C. Berkeley.

Dreeben, Robert
1968 On What is Learned in School. Reading, Mass.: Addison Wesley.

Erikson, E.H.
1959 "Identity and the Life Cycle." Psychology, No. 1

Frank, Andre G.
1969 Latin America: Underdevelopment or Revolution. New York: Monthly Review Press.

Freeman, J., and J. Kronenfeld
1973 "Problems of Definitional Dependency." Social Forces 52, pp. 108-21.

Fuiguitt, G., and S. Lieberson
1974 "Correlation of Ratios or Difference Scores Having Common Terms," H. Costner, ed., Sociological Methodology, 1973-4. Jossey-Bass, San Francisco, pp. 128-44.

Garms, Walter I.
1968 "The Correlates of Educational Effort: A Multi-variate Analysis." Comparative Educational Review 12: 281-290.

Huntington, Samuel P.
1968 "Political Modernization: America versus Europe," Chapter 2 in Samuel P. Huntington, Political Order in Changing Societies. New Haven and London: Yale University Press.

Illich, Ivan
1970 Deschooling Society. New York: Harper and Row.

Inkeles, Alex
1969 "Participant Citizenship in Six Developing Countries." American Political Science Review, 63: 4 (December), pp. 1120-1141.

Inkeles, A., and D. Smith
1974 Becoming Modern. Cambridge: Harvard.

International Bank for Reconstruction and Development, World Tables,
1971 Washington, IBRD.

International Labour Organization. Labour Force Projections, Parts,1-5.
1971 I.L.O. Geneva.

International Monetary Fund, International Financial Statistics Supplement,
1972 IMF, Washington, D.C.

Machlup, F.
1970 Education and Economic Growth. University of Nebraska Press: Lincoln.

Meyer, John, Michael Hannan, and Richard Rubinson
1973 "National Economic Growth, 1950-1965: Educational And Political Factors." SEADAG Seminar on Education and National Development, Singapore, September.

Meyer, John, John Boli-Bennett, and Christopher Chase-Dunn
1975 "Convergence and Divergence in Development." Annual Review of Sociology, pp. 223-246.

Merriam, C.
1931 The Making of Citizens. Chicago: University of Chicago Press.

Parsons, Talcott
1959 "The School Class as a Social System." Harvard Educational Review.

Ramirez, Francisco, Richard Rubinson, and John Meyer
1973 "National Educational Expansion and Political Development: Causal Interrelationships, 1950-70." Paper read at the SEADAG Seminar on Education and National Development, Singapore. To be published in John Bok and John Meyer (eds.), Comparative Studies in the Institutionalization of Education, D.C. Heath, (forthcoming).

Ramirez, Francisco O.
1974 Societal Corporateness and Status Conferral: A Comparative Analysis of the National Incorporation and Expansion of Educational Systems. Unpublished Ph.D. dissertation, Department of Sociology, Stanford University.

Reisner, E.H.
1927 Nationalism and Education Since 1789. New York: MacMillan.

Rogers, Everett M.
1963 Diffusion of Innovations. Glencoe, Ill.: Free Press.

Rubinson, Richard
1974 The Political Construction of Education. Unpublished Ph.D. dissertation. Department of Sociology, Stanford University.

Russett, Bruce, Hayward Alker, Karl Deutsch and Harold Lasswell
1964 World Handbook of Political and Social Indicators. New Haven: Yale University Press.

Schuessler, K.
1973 "Ratio Variables and Path Models," in A. Goldberger and O. Duncan, eds., Structural Equation Models in Social Science. New York: Seminar Press.

Schumpeter, Joseph.
1950 Capitalism, Socialism, and Democracy. New York: Harper and Row.

Shils, Edward
1971 "No Salvation Outside Higher Education." Minerva 6 (July) pp. 313-321.

Steadman, Henry J.
1970 "Some Causal Priorities in the Development of National Education Systems and Economic Growth." Paper presented at the American Sociological Association meetings, August.

Stinchcombe, Arthur
1965 "Social Structure and Organizations," in James G. March, (ed.) The Handbook of Organizations. Chicago: Rand McNally.

Swanson, G.
1971 "An Organizational Analysis of Collectivities." American Sociological Review 36: 4 (August), pp. 607-623.

UNESCO
1970 Statistical Yearbook. Louvain, Belgium.
1971

Thompson, Kenneth W.
1971 "Universities and the Developing World," in Stephen D. Kertesz, The Task of Universities in a Changing World. South Bend: University of Notre Dame Press.

Taylor, Charles L., and M.C. Hudson
1971 World Handbook of Political and Social Indicators II. Inter-University Consortium for Political Research. University of Michigan, Ann Arbor.

United Nations
1950 International Trade Statistics. New York: United Nations.

Wallerstein, I.
1974 The Modern World-System. New York: Academic Press.

Waterston, A.
1965 Development Planning: Lessons of Experience. Baltimore: Johns Hopkins.

Warren, Jean
1973 "An Ecological Analysis of the Expansion of National Educational Systems." Unpublished Ph.D. dissertation, Department of Sociology, Stanford University.

Table 1

MEAN PRIMARY, SECONDARY, AND HIGHER EDUCATIONAL ENROLLMENTS AS PERCENTS OF THE APPROPRIATE AGE GROUP POPULATIONS: FOR ALL AVAILABLE COUNTRIES, AND SEPARATELY FOR RICHER[a] AND POORER ONES, 1950, 1960, and 1970

	1950 Mean %	1960 Mean %	1970 Mean %	Cases
A. Primary students/age group pop.				
All countries	58	71	83	117
Richer countries[a]	90	98	102[b]	51
Poorer countries	37	53	72	56
B. Secondary students/age group pop.				
All countries	12.7	21.5	30.5	102
Richer countries	21.3	35.8	46.4	49
Poorer countries	5.3	9.4	17.0	46
C. Higher Ed. students/age group pop.				
All countries	1.4	2.8	5.3	109
Richer countries	2.6	5.2	9.2	46
Poorer countries	0.6	1.2	2.6	55

a. Richer countries are defined as those above the median in 1950 GNP/Capita ($172 in 1964 U.S. dollars). Cases do not add to total because of missing information on GNP/Capita.

b. Percentage can exceed 100 for several statistical reasons noted in the text. Note that several statistical factors can inflate estimates of primary enrollments.

Table 2

MODELS OF EDUCATIONAL EXPANSION, 1955-1970: ORDINARY LEAST SQUARES ESTIMATES[a]

Table entries are slopes, (standard errors), and standardized slopes.
*, significant at or below .05

	Independent Variables							
	Contagion Term	Constant Rate of Penetration Term	Mixed Term	Population Growth	Control[a] Term	Constant	R^2	Cases
A. Dependent Variable: Primary Enrollment Ratio Growth: 1970-55[b]	$p_{55}(1-p_{55})$	$(1-p_{55})$		$\frac{\text{Prim.Pop.}_{70}}{\text{Prim.Pop.}_{55}}$[d]	$\frac{1}{\text{Prim.Pop.}_{70}}$			
	*1.96(.38).58	*.25(.09).31		*-.21(.09)-.25	39(54).07	.13	.27	81
B. Dependent Variable: Secondary Enrollment Ratio Growth: 1970-55	$s_{55}(1-s_{55})$		$p_{55}(1-s_{55})$	$\frac{\text{Pop.}_{70}}{\text{Pop.}_{55}}$[c]	$\frac{1}{\text{Pop.}_{70}}$			
	.26(.16).17		*.22(.05).48	*.08(.04).19	.85(23.6).00	-.108	.36	96
C. Dependent Variable: Higher Ed. Enrollment Ratio Growth: 1970-55	$t_{55}(1-t_{55})$		$s_{55}(1-t_{55})$	$\frac{\text{Pop.}_{70}}{\text{Pop.}_{55}}$[c]	$\frac{1}{\text{Pop.}_{70}}$			
	*.64(.18).38		*.12(.03).47	.01(.01).05	-1.30(5.8)-.02	-.001	.60	89

Notes:
a. As noted in the text, the raw slopes may be interpreted as weighted least squares estimates of raw enrollments in 1970, as an alternative to the ratio interpretation given here.
b. Cases above 90% on primary enrollment ratio in 1955 are excluded from the analysis.
c. Population growth rates, rather than the growth rates in age group population are used in the equations for secondary and higher education, because data on many more countries are available.
d. Primary age group population calculated from UNESCO data on raw enrollments and enrollment ratios.

Table 3

MULTIVARIATE ANALYSES OF THE EFFECTS OF ECONOMIC, POLITICAL, AND SOCIAL VARIABLES ON EDUCATIONAL EXPANSION, 1955-1970
*, .05 < p < .10; **, p < .05: cases in parentheses

a. Partial effects (standardized slopes) of indicators of economic development, with models of endogenous educational expansion (as defined in Table 2) held constant.[a]

	Dependent Educational Variable: Prim. Ratio[c] Growth (1970-55)	Sec. Ratio Growth (1970-55)	Higher Ed. Ratio Growth (1970-55)
Economic Indicator:			
Log GNP/Capita 1955	.10 (62)	*.21 (88)	.13 (84)
Log KWH/Capita 1955	.10 (51)	*.24 (78)	**.24 (69)
% Male Labor Force Not in Ag. 1950	.09 (78)	*.18 (95)	.02 (89)

b. Partial effects (standardized slopes) of social and political factors, with Log GNP/Capita and with models of educational expansion (as defined in Table 2) held constant.[a,b]

	Dependent Educational Variable: Prim. Ratio[c] Growth (1970-55)	Sec. Ratio Growth (1970-55)	Higher Ed. Ratio Growth (1970-55)
(1) Indicators of Political and Social Modernization:			
Urbanization, 1950	.13 (61)	-.02 (88)	-.02 (84)
Formal Political Rep. 1951-55[f,g,i]	.17 (27)	.04 (44)	.25 (41)
Polit. Particip. 1957-62[f,h,i]	-.03 (42)	.23 (51)	.20 (43)
Political Modernization	**-.35 (59)	.03 (85)	.09 (81)
(2) Indicators of State Power and Authority in Society:			
Government Rev./GDP 1955[f,i]	-.09 (32)	.17 (48)	.02 (44)
Cabinet Size 1950[i]	.01 (34)	.12 (54)	.03 (48)
State Centralization	.00 (62)	.08 (88)	-.03 (84)
(3) Ethnolinguistic Fractionalization	-.09 (62)	-.04 (88)	-.05 (84)
(4) Economic and Political Dependence:			
Independent 1945-1957 vs Pre-1945[d,e]	-.10 (43)	-.02 (61)	-.12 (56)
Not Ind. by 1957 vs Ind. Pre-1957[d]	.16 (62)	-.10 (88)	-.11 (84)
Export Partner Concentration, 1955	.16 (43)	**-.26 (69)	-.07 (64)

a. Throughout these analyses, the factors defined (and coefficients derived) in Table 2 continue to show significant positive effects on educational expansion. For simplicity, these effects are not reported here.

b. Throughout these analyses, Log GNP/Capita usually continues to have positive (though insignificant) effects on enrollment expansion. When Formal Political Representation is introduced, these effects actually reverse in sign, but this appears to be an artifact of the particular set of cases involved in these analyses, not an instance of a spurious relationship.

c. Countries over 90% on primary enrollment ratio in 1955 excluded.

d. Countries independent later coded high.

e. Countries not independent by 1957 excluded.

f. Communist countries excluded because of measurement ambiguities.

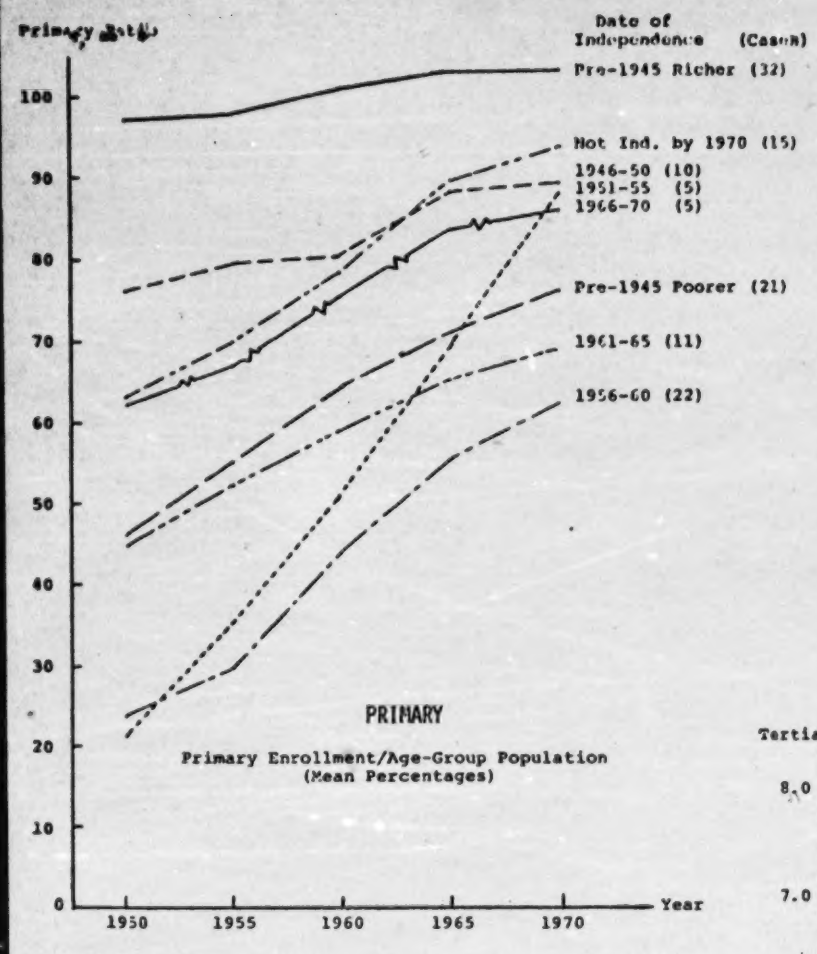
g. Data mostly on richer countries.

h. Data mostly on poorer countries.

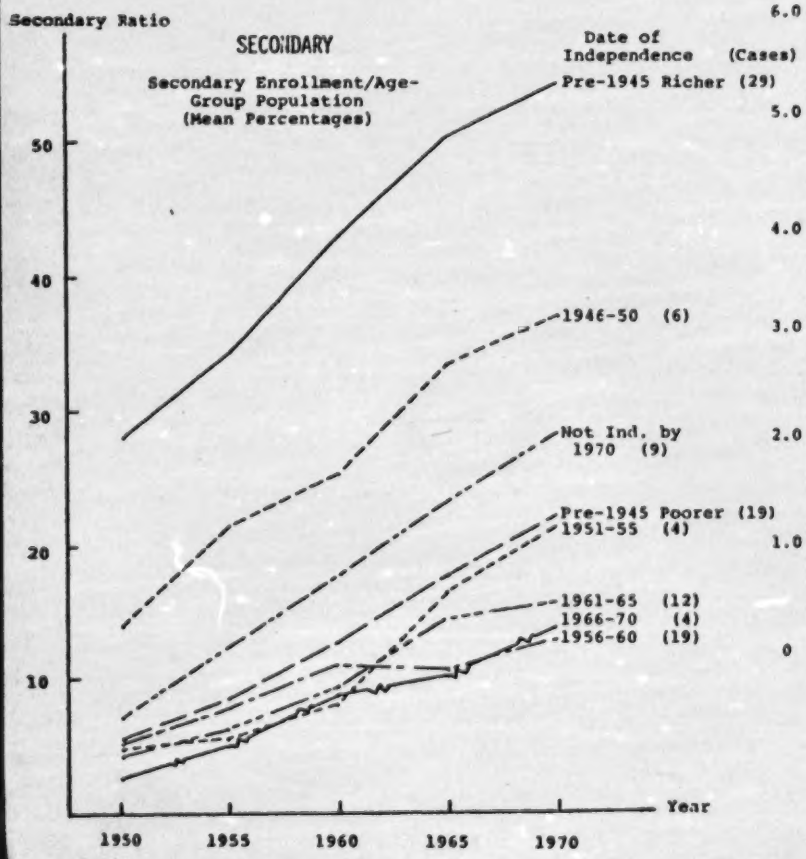
i. Independent countries only.

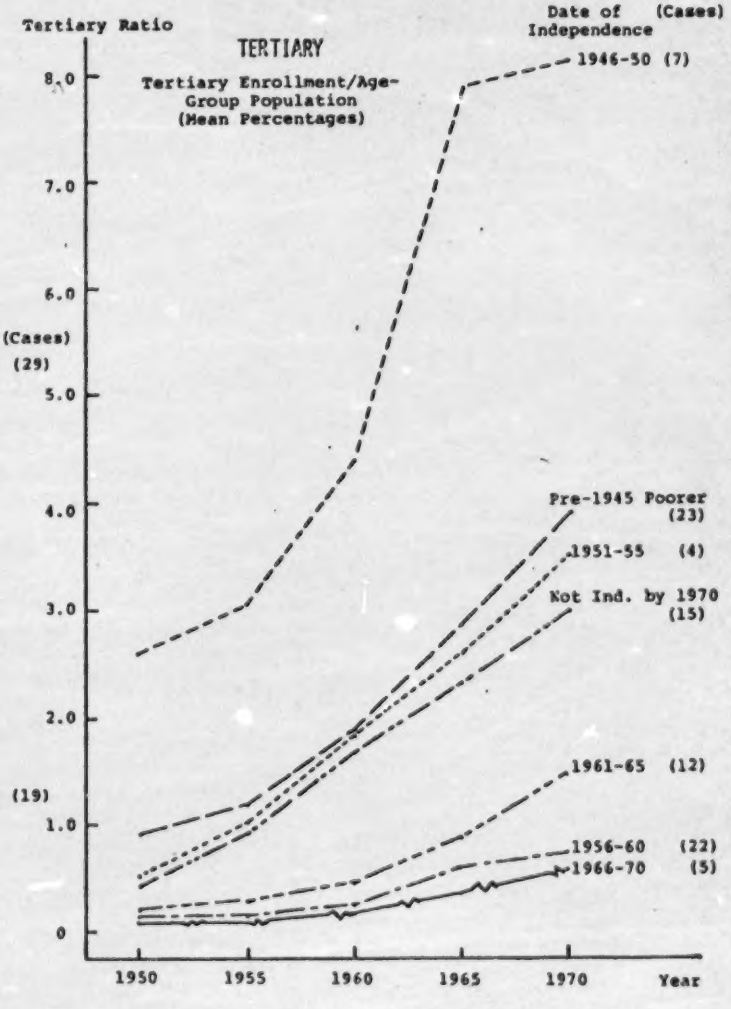
TABLE 4

GROWTH IN EDUCATIONAL ENROLLMENT RATIOS, 1950-1970, BY DATE OF INDEPENDENCE OF COUNTRY
(Mean Percentages)



Note: Countries independent before 1945 are separated into richer and poorer subsamples (those above and those below GNP/Capita of $278 in 1955; 1964 U.S. dollars). Countries independent after 1945 generally fall in the poorer subsample.
Source: UNESCO (1971)





Note: Richer countries independent before 1945 are excluded because they go off the scale used here. The mean for those 26 countries increases as follows: 1950, 3.68%; 1955, 4.82%; 1960, 7.31%; 1965, 10.8%; 1970, 12.2%.